TH

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,142	03/29/2004	Cor F. van Egmond	2004B023	3237

23455 7590 06/14/2007

EXXONMOBIL CHEMICAL COMPANY
5200 BAYWAY DRIVE
P.O. BOX 2149
BAYTOWN, TX 77522-2149

EXAMINER
BOYER, RANDY

ART UNIT	PAPER NUMBER
1764	

MAIL DATE	DELIVERY MODE
06/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/812,142	VAN EGMOND ET AL.	
	Examiner	Art Unit	
	Randy Boyer	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :29 March 2004, 14 March 2005, and 22 September 2005.

DETAILED ACTION

Election/Restrictions

1. Upon further consideration, the restriction requirement presented orally to David Weisberg, attorney for Applicant, on June 1, 2007 is hereby withdrawn. Consequently, all claims (1-46) are presently examined.

Claim Rejections - 35 USC § 112

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. With respect to claim 1, the phrase "or the like" renders the claim(s) indefinite because the claim includes elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 8-11, 15-17, 20-31, 38-40, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Jörgensen (US 4509326).

6. With respect to claim 1, Jörgensen discloses a process for recovering heat from a high temperature effluent stream from catalyst regeneration, wherein the process comprises the steps of: (a) passing the effluent stream (3) through a heat exchanger (10) associated with a steam generator (9) fed with boiler feed water (through a boiler feed water valve (5)) to produce high pressure steam and partially cool the effluent stream; (b) passing the partially cooled effluent stream through a heat exchanger (7) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cool the effluent stream; and (c) passing the preheated boiler feed water to the steam generator (9) (see Jörgensen, column 3, lines 7-45; and Fig. 2).

7. With respect to claim 8, Jörgensen discloses wherein the further cooled effluent stream contains catalyst fines (see Jörgensen, column 2, lines 59-68) and is directed to a catalyst fines removal unit (15) for removal of the catalyst fines.

8. With respect to claim 9, Jörgensen discloses wherein the catalyst fines removal unit is a cyclone separator (see Jörgensen, column 3, lines 35-40).

9. With respect to claim 10, Jörgensen discloses wherein the effluent stream is passed from the catalyst fines removal unit (15) to a flue gas stack (18) for disposal in ambient atmosphere (see Jörgensen, column 3, lines 35-45; and Fig. 2).

10. With respect to claim 11, Jörgensen discloses wherein the high temperature effluent stream contains catalyst fines and is directed to a catalyst fines removal unit before step (a) for removal of the catalyst fines (see Jörgensen, column 2, lines 59-68).

11. With respect to claim 15, Jörgensen discloses wherein the preheated boiler feed water and the high pressure steam from the steam generator are mixed in a steam drum (8) and liquid boiler feed water is passed from the steam drum (8) to the steam generator (9) (see Jörgensen, column 3, lines 7-20; and Fig. 2).

12. With respect to claim 16, Jörgensen discloses wherein high pressure steam is taken from the steam drum (see Jörgensen, column 3, lines 7-20; and Fig. 2).

13. With respect to claim 17, Jörgensen discloses wherein the high temperature effluent stream is taken from a catalyst regenerator of a fluidized catalytic cracker (see Jörgensen, column 2, lines 59-63).

14. With respect to claim 20, Jörgensen discloses wherein the steam generator and the preheater are located within a common enclosure (see Jörgensen, Fig. 2).

15. With respect to claim 21, Jörgensen discloses an apparatus for recovering heat from a catalytic reactor system, comprising: (a) a catalyst regenerator (1) having an outlet for hot flue gas; (b) a steam generator (9) comprising a first indirect heat exchanger operatively connected to receive hot flue gas from the catalyst regenerator and a supply of high pressure liquid boiler feed water (from steam drum (8)); (c) a boiler feed water preheater (7) comprising a second indirect heat exchanger connected to receive the boiler feed water and operatively connected to receive partially cooled flue gas from the steam generator; (d) conduit means for passing preheated high pressure boiler feed water from the preheater to the steam generator; and (e) means for recovering high pressure steam from the steam generator (see Jörgensen, column 3, lines 7-45; and Fig. 2).

16. With respect to claim 22, Jörgensen discloses wherein the apparatus further comprises a steam drum (8) operatively connected to receive the preheated boiler feed water and high pressure steam for mixing in the steam drum, and conduit means for passing liquid boiler feed water from the steam drum to the steam generator (see Jörgensen, column 3, lines 7-20; and Fig. 2).

17. With respect to claim 23, Jörgensen discloses wherein the apparatus further comprises a conduit means for passing high pressure steam from the steam drum (see Jörgensen, column 3, lines 7-20; and Fig. 2).

18. With respect to claim 24, Jörgensen discloses wherein the steam generator (9) and the preheater (7) are located within a common enclosure (see Jörgensen, Fig. 2).

19. With respect to claim 25, Jörgensen discloses a process for catalytic conversion using a catalyst which accumulates carbonaceous deposit during operation of a catalytic reactor, wherein the carbonaceous deposit is removed in a high temperature regenerator unit with a regeneration medium, the process comprising the steps of: (a) passing a high temperature effluent stream (3) containing catalyst fines from the regenerator unit to a heat exchanger (10) associated with a steam generator (9) fed with boiler feed water (through boiler feed water valve (5)), to produce high pressure steam and a partially cooled effluent stream; (b) passing the partially cooled effluent stream to a heat exchanger (7) associated with a high pressure boiler feed water preheater to further cool the effluent stream; and (c) further treating the effluent stream to remove the catalyst fines (see Jörgensen, column 3, lines 35-40).

20. With respect to claim 26, Jörgensen discloses a process for catalytic conversion using a catalyst which accumulates carbonaceous deposit during operation of a catalytic reactor, wherein the carbonaceous deposit is removed in a high temperature regenerator unit with a regeneration medium, the process comprising the steps of: (a) passing a high temperature effluent stream (3) from the regenerator unit to a heat exchanger (10) associated with a steam generator (9) fed with boiler feed water (through boiler feed water valve (5)), to produce high pressure steam and a partially cooled effluent stream; (b) passing the partially cooled effluent stream to a heat exchanger (7) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cooled effluent stream; (c) passing the preheated boiler feed water and the high pressure steam from the steam generator (9) to a steam drum (8) for direct contact and mixing; (d) recovering high pressure steam from the steam drum (8); and (e) passing liquid boiler feed water from the steam drum (8) to the steam generator (9), thereby providing efficient recovery of thermal value.

21. With respect to claim 27, Jörgensen discloses wherein the further cooled effluent stream contains catalyst fines (see Jörgensen, column 2, lines 59-68) and is passed to a catalyst fines removal unit (15) for removal of the catalyst fines.

22. With respect to claim 28, Jörgensen discloses wherein the catalyst fines removal unit (15) is a cyclone separator (see Jörgensen, column 3, lines 35-40).

23. With respect to claims 29 and 30, Jörgensen discloses wherein the catalyst fines comprise particles whose largest particle dimension is less than about 60 microns (see Jörgensen, column 2, lines 63-68).

24. With respect to claim 31, Jörgensen discloses wherein the effluent stream is passed from the catalyst fines removal unit (15) to a flue gas stack (18) for disposal in ambient atmosphere (see Jörgensen, column 3, lines 35-45; and Fig. 2).

25. With respect to claim 38, Jörgensen discloses wherein the preheated boiler feed water and the high pressure steam from the steam generator are mixed in a steam drum (8) and liquid boiler feed water is passed from the steam drum (8) to the steam generator (9) (see Jörgensen, column 3, lines 7-20; and Fig. 2).

26. With respect to claim 39, Jörgensen discloses wherein high pressure steam is taken from the steam drum (see Jörgensen, column 3, lines 7-20; and Fig. 2).

27. With respect to claim 40, Jörgensen discloses wherein the high temperature effluent stream is taken from a catalyst regenerator of a fluidized catalytic cracker (see Jörgensen, column 2, lines 59-63).

28. With respect to claim 44, Jörgensen discloses wherein the steam generator and the preheater are located within a common enclosure (see Jörgensen, Fig. 2).

Claim Rejections - 35 USC § 103

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

30. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

31. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

32. Claims 2, 3, 32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woebcke (US 3910768).

33. With respect to claims 2 and 3, Woebcke discloses a process for recovering heat from a high temperature effluent stream, wherein the process comprises the steps of: (a) passing the effluent stream (122) through a heat exchanger (111) associated with a steam generator (106) fed with boiler feed water to produce high pressure steam and partially cool the effluent stream; (b) passing the partially cooled effluent stream through a heat exchanger (124) associated with a high pressure boiler feed water preheater to

provide preheated boiler feed water and further cool the effluent stream; and (c) passing the preheated boiler feed water to a steam generator (126); wherein the high temperature effluent stream has a temperature of a about 704°C (see Woebcke, column 5, lines 4-6), and the partially cooled effluent stream has a temperature of about 232°C (see Woebcke, column 5, lines 24-26).

Woebcke does not disclose wherein the further cooled effluent stream has a temperature not greater than about 127°C or ranging from about 116°C to about 204°C.

However, Woebcke discloses wherein the partially cooled effluent stream having a temperature of about 232°C is quenched in a downstream quench tower (see Woebcke, column 5, lines 26-29). The person having ordinary skill in the art would recognize that quenching of the partially cooled effluent stream would result in a further cooling of such stream to a temperature below 232°C.

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide a further cooled effluent stream having a temperature not greater than about 127°C or ranging from about 116°C to about 204°C. Moreover, the court has generally held that differences in temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such temperature is critical. *See* MPEP § 2144.05(II)(A).

34. With respect to claims 32 and 33, Woebcke discloses a process for catalytic conversion using a catalyst which accumulates carbonaceous deposit during operation of a catalytic reactor, wherein the carbonaceous deposit is removed in a high temperature regenerator unit with a regeneration medium, the process comprising the

steps of: (a) passing a high temperature effluent stream (122) from the regenerator unit to a heat exchanger (111) associated with a steam generator (106) fed with boiler feed water, to produce high pressure steam and a partially cooled effluent stream; (b) passing the partially cooled effluent stream to a heat exchanger (124) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cooled effluent stream; (c) passing the preheated boiler feed water and the high pressure steam from the steam generator (106 or 126) to a steam drum (108 or corresponding structure coupled to steam generator 126) for direct contact and mixing; (d) recovering high pressure steam from the steam drum (108 or corresponding structure coupled to steam generator 126); and (e) passing liquid boiler feed water from the steam drum (108 or corresponding structure coupled to steam generator 126) to the steam generator (106 or 126), thereby providing efficient recovery of thermal value; wherein the high temperature effluent stream has a temperature of a about 704°C (see Woebcke, column 5, lines 4-6), and the partially cooled effluent stream has a temperature of about 232°C (see Woebcke, column 5, lines 24-26).

Woebcke does not disclose wherein the further cooled effluent stream has a temperature not greater than about 127°C or ranging from about 116°C to about 204°C.

However, Woebcke discloses wherein the partially cooled effluent stream having a temperature of about 232°C is quenched in a downstream quench tower (see Woebcke, column 5, lines 26-29). The person having ordinary skill in the art would recognize that quenching of the partially cooled effluent stream would result in a further cooling of such stream to a temperature below 232°C.

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide a further cooled effluent stream having a temperature not greater than about 127°C or ranging from about 116°C to about 204°C. Moreover, the court has generally held that differences in temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such temperature is critical. *See* MPEP § 2144.05(II)(A).

35. Claims 4, 12-14, 25, 26, 34, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jörgensen (US 4509326).

36. With respect to claim 4, Jörgensen discloses a process for recovering heat from a high temperature effluent stream from catalyst regeneration, wherein the process comprises the steps of: (a) passing the effluent stream (3) through a heat exchanger (10) associated with a steam generator (9) fed with boiler feed water (through a boiler feed water valve (5)) to produce high pressure steam and partially cool the effluent stream; (b) passing the partially cooled effluent stream through a heat exchanger (7) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cool the effluent stream; and (c) passing the preheated boiler feed water to the steam generator (9) (see Jörgensen, column 3, lines 7-45; and Fig. 2); wherein the high temperature effluent stream has a temperature of about 700°C, and the partially cooled effluent stream has a temperature of about 300°C (see Jörgensen, column 3, lines 35-40).

Jörgensen does not disclose wherein the further cooled effluent stream has a temperature ranging from about 127°C to about 160°C.

However, Jörgensen discloses wherein the partially cooled effluent stream is passed through an expansion turbine (17) to be evacuated cold to the ambient environment (see Jörgensen, column 3, lines 41-45). The person having ordinary skill in the art would recognize that passing the partially cooled effluent stream through an expansion turbine would have the effect of lowering the temperature of such stream to a temperature less than 300°C.

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide a further cooled effluent stream having a temperature ranging from about 127°C to about 160°C. Moreover, the court has generally held that differences in temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such temperature is critical. *See* MPEP § 2144.05(II)(A).

37. With respect to claim 12, Jörgensen discloses a process for recovering heat from a high temperature effluent stream from catalyst regeneration, wherein the process comprises the steps of: (a) passing the effluent stream (3) through a heat exchanger (10) associated with a steam generator (9) fed with boiler feed water (through a boiler feed water valve (5)) to produce high pressure steam and partially cool the effluent stream; (b) passing the partially cooled effluent stream through a heat exchanger (7) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cool the effluent stream; and (c) passing the preheated boiler feed water to the steam generator (9) (see Jörgensen, column 3, lines 7-45; and Fig. 2); and wherein the high temperature effluent stream contains catalyst fines and is directed

to a catalyst fines removal unit before step (a) for removal of the catalyst fines (see Jörgensen, column 2, lines 59-68).

Jörgensen does not disclose wherein the catalyst fines removal unit is selected from the group consisting of a cyclone separator or other inertial separation device, a metal filter, and a ceramic filter.

However, Jörgensen discloses wherein the catalyst fines removal unit used in the removal of catalyst fines from the further cooled effluent stream is a cyclone separator (see Jörgensen, column 3, lines 35-38). The person having ordinary skill in the art would recognize that a similar cyclone separator could be used in removing catalyst fines from the high temperature effluent stream prior to the passing of such stream to a downstream heat recovery process (i.e. prior to step (a) of claim 1).

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide a cyclone separator as the catalyst fines removal unit for the removal of catalyst fines from the high temperature effluent stream.

38. With respect to claims 13 and 14, Jörgensen discloses wherein the further cooled effluent stream contains catalyst fines (see Jörgensen, column 2, lines 59-68) and is directed to a catalyst fines removal unit (15) for removal of the catalyst fines; and wherein the catalyst fines removal unit is a cyclone separator (see Jörgensen, column 3, lines 35-40).

Jörgensen does not disclose wherein the catalyst fines removal unit is used to remove catalyst fines from the partially cooled effluent stream.

However, the court has held that the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. *See* MPEP § 2144.04(IV)(C) (citing *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946)).

Therefore, Examiner finds no patentable weight in the placement of the catalyst fines removal unit so as to remove catalyst fines from the partially cooled effluent stream rather than from the further cooled effluent stream, as taught by Jörgensen, because the effect is exactly the same regardless of placement of such unit – i.e. to remove catalyst fines from the effluent stream.

39. With respect to claim 25, Jörgensen discloses a process for catalytic conversion using a catalyst which accumulates carbonaceous deposit during operation of a catalytic reactor, wherein the carbonaceous deposit is removed in a high temperature regenerator unit with a regeneration medium, the process comprising the steps of: (a) passing a high temperature effluent stream (3) containing catalyst fines from the regenerator unit to a heat exchanger (10) associated with a steam generator (9) fed with boiler feed water (through boiler feed water valve (5)), to produce high pressure steam and a partially cooled effluent stream; (b) passing the partially cooled effluent stream to a heat exchanger (7) associated with a high pressure boiler feed water preheater to further cool the effluent stream; and (c) further treating the effluent stream to remove the catalyst fines (see Jörgensen, column 3, lines 35-40).

Jörgensen does not disclose wherein the catalyst is a molecular sieve catalyst. However, Jörgensen's process is not specifically limited to the type of catalyst

used for catalytic conversion. Moreover, it is known in the art to use molecular sieve catalysts for the fluidized catalytic cracking of hydrocarbon streams (see e.g., Vaughn (US 2002/0016522) at page 9, paragraph 96).

Therefore, it would have been obvious to the person having ordinary skill in the art of catalytic conversion processes to provide a molecular sieve type catalyst for use in the process of Jörgensen.

40. With respect to claim 26, Jörgensen discloses a process for catalytic conversion using a catalyst which accumulates carbonaceous deposit during operation of a catalytic reactor, wherein the carbonaceous deposit is removed in a high temperature regenerator unit with a regeneration medium, the process comprising the steps of: (a) passing a high temperature effluent stream (3) from the regenerator unit to a heat exchanger (10) associated with a steam generator (9) fed with boiler feed water (through boiler feed water valve (5)), to produce high pressure steam and a partially cooled effluent stream; (b) passing the partially cooled effluent stream to a heat exchanger (7) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cooled effluent stream; (c) passing the preheated boiler feed water and the high pressure steam from the steam generator (9) to a steam drum (8) for direct contact and mixing; (d) recovering high pressure steam from the steam drum (8); and (e) passing liquid boiler feed water from the steam drum (8) to the steam generator (9), thereby providing efficient recovery of thermal value.

Jörgensen does not disclose wherein the catalyst is a molecular sieve catalyst. However, Jörgensen's process is not specifically limited to the type of catalyst

used for catalytic conversion. Moreover, it is known in the art to use molecular sieve catalysts for the fluidized catalytic cracking of hydrocarbon streams (see e.g., Vaughn (US 2002/0016522) at page 9, paragraph 96).

Therefore, it would have been obvious to the person having ordinary skill in the art of catalytic conversion processes to provide a molecular sieve type catalyst for use in the process of Jörgensen.

41. With respect to claim 34, see discussion *supra* at paragraph 41.

42. With respect to claims 45 and 46, Jörgensen discloses wherein the partially cooled effluent stream has been cooled to no less than about 277°C, and the partially cooled effluent stream is then passed through an expansion turbine (17) to produce a further cooled effluent stream at a temperature lower than the partially cooled effluent stream (see Jörgensen, column 3, lines 41-45).

43. Claims 5-7, 18, 19, 35-37, and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haddad (US 5043517).

44. With respect to claims 5-7, Haddad discloses a process for recovering heat from a high temperature effluent stream from catalyst regeneration or the like, wherein the process comprises the steps of: (a) passing the effluent stream (10) through a heat exchanger (33b) associated with a steam generator (31) fed with boiler feed water (30) to produce high pressure steam (35) and partially cool the effluent stream; (b) passing the partially cooled effluent stream through a heat exchanger (33a) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cool the effluent stream; and (c) passing the preheated boiler feed water to the

steam generator (see Haddad, Fig. 1 and accompanying disclosure at columns 15-18); and wherein the preheated boiler feed water is under high pressure (see Haddad, column 17, lines 26-29) and has a temperature ranging from about 236°C to 260°C (see Haddad, column 17, lines 8-12).

Haddad does not disclose wherein the boiler feed water has a pressure ranging from about 4240 kPa to about 6309 kPa.

However, Haddad's upper temperature limit of 260°C for the preheated boiler feed water corresponds to a pressure of about 680 kPa (or about 4688 kPa) as can be confirmed from a review of engineering tables for saturated steam at a temperature of 260°C.

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide boiler feed water having a pressure of about 4688 kPa, corresponding to a saturated steam temperature of 260°C which Haddad discloses as the boiler feed water temperature.

45. With respect to claims 18 and 19, Haddad discloses wherein the feed may be methanol containing etherification debutanizer overhead such as from an MTBE unit (see Haddad, column 8, lines 46-52).

46. With respect to claims 35-37, Haddad discloses Haddad discloses a process for catalytic conversion using a molecular sieve catalyst which accumulates carbonaceous deposit during operation of the catalytic reactor, wherein the carbonaceous deposit is removed in a high temperature regenerator unit with a regeneration medium, the process comprising the steps of: (a) passing the effluent stream (10) through a heat

exchanger (33b) associated with a steam generator (31) fed with boiler feed water (30) to produce high pressure steam (35) and partially cool the effluent stream; (b) passing the partially cooled effluent stream through a heat exchanger (33a) associated with a high pressure boiler feed water preheater to provide preheated boiler feed water and further cool the effluent stream; and (c) passing the preheated boiler feed water to the steam generator (see Haddad, Fig. 1 and accompanying disclosure at columns 15-18); and wherein the preheated boiler feed water is under high pressure (see Haddad, column 17, lines 26-29) and has a temperature ranging from about 236°C to 260°C (see Haddad, column 17, lines 8-12).

Haddad does not disclose wherein the preheated boiler feed water and high pressure steam from the steam generator are passed to a "steam drum" for direct contacting and mixing; or wherein the boiler feed water has a pressure ranging from about 4240 kPa to about 6309 kPa.

However, the process of Haddad achieves the same result as that of Applicant's claim 26 – i.e. the generation and recovery of high pressure steam – even in the absence of a "steam drum." Consequently, Examiner finds that the addition of a steam drum as included in Applicant's claim 26 does not patentably distinguish over the teachings of Haddad because Haddad provides explicit suggestion for the generation and recovery of high pressure steam (e.g. via Haddad's heat exchanger 33b). Moreover, Haddad's upper temperature limit of 260°C for the preheated boiler feed water corresponds to a pressure of about 680 kPa (or about 4688 kPa) as can be

confirmed from a review of engineering tables for saturated steam at a temperature of 260°C.

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to (1) provide a "steam drum" as a substitute means for generating and recovering high pressure steam consistent with Haddad's process, and (2) provide boiler feed water having a pressure of about 4688 kPa, corresponding to a saturated steam temperature of 260°C which Haddad discloses as the boiler feed water temperature.

47. With respect to claims 41 and 42, Haddad discloses wherein the feed may be methanol containing etherification debutanizer overhead such as from an MTBE unit (see Haddad, column 8, lines 46-52).

48. With respect to claim 43, Haddad discloses a multitude of various zeolite catalyst materials for use with his process (see Haddad, columns 9 and 10), i.e. Haddad's process is not specifically limited to any one catalyst type. Moreover, SAPO-34 is known in the art as an effective catalyst for use in methanol to olefins reactions (see e.g., Vaughn (US 2002/0016522) at page 10, paragraph 102).

Conclusion

49. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB

Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700